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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/086,742

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Yasushi Sugaya

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06/21/2006

STAAS & HALSEY LLP

SUITE 700

1201 NEW YORK AVENUE, N.W.

WASHINGTON, DC 20005

EXAMINER

HUGHES, DEANDRA M

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/086,742

Applicant(s)

SUGAYA ET AL.

Examiner

Deandra M. Hughes

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 8-30 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-4 and 8-30 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 5/15/06 have been fully considered but they are not persuasive.

Applicant argues the following:

- (A) "It should be understood that the variation in the power of the input light is a phenomenon that occurs not in the wavelength domain but in the time domain, and that maintaining the waveform dependence of the gain to be constant (flat) irrespective of a variation in the input power is also a function with respect to the time domain." (pg. 9, last paragraph).
- (B) "DiGiovanni does not disclose or suggest a level controller which controls a power level of the WDM optical signal amplified by the first-stage optical amplifier, as recited, for example, in claim 1." "In the office action, the Examiner correlates element 36 of DiGiovanni to the claimed level controller. However, element 36 of DiGiovanni operates as a filter to pass amplified channels and suppress spontaneous emission." (pg. 10, last paragraph)
- (C) The equation disclosed in column 4, line 50 of DiGiovanni does not "disclose or suggest that a multi-stage optical amplifier amplifies a WDM optical signal with substantially equal gain with respect to the wavelengths of the plurality of the optical signals independently of variation of the received WDM optical signal..." (pg. 11, 3rd paragraph).

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2. Argument (A) is not convincing because, again, the disclosure has not a single reference to time or any synonym thereof. Applicant appears to be suggesting that the gain is constant (flat) with respect to time. However, the disclosure explicitly states that the gain is constant with respect to wavelength. For example, see figures 2, 4, and 6. Further, every instance of the word "constant" pertains to a gain that is constant *with respect to wavelength*. Further, the passages cited in Remarks of page 9 which the applicant purports to support a gain constant in time simply cannot be construed in anyway to provide enablement for "substantially equal gain, over the wavelengths, and time...".

3. Argument (B) is not convincing because applicant has ignored the Examiner's explicit reference to the level controller (see Office Action dated 12/2/05; page 3, line 9). The Examiner explicit referenced col. 4, line 64 of DiGiovanni that states, "the interstage filter may have to equalize large gain differences between the channels." This is level control. Merely stating that the element 36 operates as a filter to pass amplified channels and suppress spontaneous emission does not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

4. Argument (C) is not convincing because DiGiovanni discloses the net gain adjustment while attempting to equalize the amplifier gain is:

$$dG(\lambda_{s2}) = dG(\lambda_{s1})\delta E(\lambda_{s1}, \lambda_{s2}) \quad (\text{col. 4, line 50})$$

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As can be seen above, the gain adjustment is independent of variation of the received WDM signal level. Further, col. 4, lines 59-60 disclose that the equation is to “compensate for the difference between the two channels”, i.e. make the gain independent of the variation of the received channels.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-4 and 8-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over DiGiovanni (US 5,050,949 published Sept. 24, 1991) in view of Naito (US 5,568,310 filed May 4, 1995).

With regard to claims 1, 3-4, 8, 10-12, 14-16, 18-19, DiGiovanni discloses a multi-stage optical amplifier (fig. 1; EDFAs #16 and #26) for amplifying received WDM signals (IN) with substantially equal gain (fig. 4) with respect to the wavelengths of the plurality of optical signals (1540.5nm and 1538nm) and for outputting the amplified WDM signal. The multistage amplifier includes a first stage (#16) and a second stage (#26) with a level controller (#36; col. 4, line 64) situated between them for controlling the power level of the WDM signal amplified in the 1st stage.

However, DiGiovanni does not specifically disclose a transmitter and receiver. This is well known in the art. Further, it is taught by Naito (TX and RX). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to use the multistage optical amplifier in a transmission system for the advantage of compensating for power loss during transmission.

With regard to claims 2, 9, 13, 17, DiGiovanni discloses:

- a first optical transmission line (line through which signals travel) through which a WDM optical signal including a plurality of optical signals with different wavelengths are transmitted (1540.5nm and 1538nm)
- a multi-stage optical amplifier (#16 and #26) to amplify the WDM optical signal with substantially equal gain (fig. 4) over the wavelengths of the optical signals; and
- a second optical transmission line (second arrow on the extreme right of fig. 1) through which the amplified WDM optical signals is transmitted, wherein the multi-stage optical amplifier includes:
 - o a front stage optical amplifier (#16) which amplifies the WDM optical signal to produce a front-stage amplified WDM optical signal;
 - o a level controller (#36; col. 4, line 64) which controls a power level of the front-stage amplified WDM optical signal and outputs a controlled WDM optical signal (#36 is situated between the two stages); and
 - o a rear-stage optical amplifier (#26) which amplifies the controlled WDM optical signal to produce a rear-stage amplified WDM optical signal.

However, DiGiovanni does not specifically disclose a transmitter and receiver. This is well known in the art. Further, it is taught by Naito (TX and RX). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to use the multistage optical amplifier in a transmission system for the advantage of compensating for power loss during transmission.

With regard to claims 20-30, DiGiovanni discloses receiving an input at the 1st amplifier stage (fig. 1, IN) and outputting a signal at the 2nd amplifier stage (fig. 1, OUT).

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 3-4, 10-11, 13-14, 17-18, 21-22, 25-26, and 28-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The added material which is not supported by the original disclosure is as follows.

Claims 3-4 and 13-14 claim "...with substantially equal gain, over the wavelengths of the optical signals and time..." (lines 6 and 3, respectively; emphasis mine). In pg. 10 of the Remarks filed 10/6/05, applicant points to pg. 2, lines 16-20; fig. 1, pg. 11, lines 29-34, and pg. 12, lines 17-19 to support this amendment. However, the cited sections do not support the amendment. Further, the Examiner has not been able to identify a single occurrence of the word 'time' in applicant's specification.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Deandra M. Hughes
Primary Examiner
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